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Feasibility study on the search for an exotic decay of the Higgs boson into two light pseudoscalars in e+e-collider

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A feasibility study is conducted to search for an exotic decay of the Standard Model Higgs boson decaying into a pair of light pseudoscalar bosons in the Cool Copper Collider (C3) experiment. The Higgs boson is produced in association with a Z boson and the decay products consist of a pair of b-quarks and tau leptons. The pseudoscalar bosons are probed over a mass range spanning from 20 to 60 GeV. A simplified algorithm is devised to reconstruct the tau lepton in its hadronic decay mode. A limit on the branching ratio of the Higgs boson to a pair of light pseudoscalars is presented assuming 1 fb⁻¹ of data.

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